REMARKS

These comments are responsive to the Office Action dated January 10, 2007, and for which a one-month extension is hereby requested.

Concerning the Office Actions comments under "Response to Amendment", it is noted that the previous Amendment had already cancelled withdrawn claims 6, 8, 9, and 13-23. (This was indicated in the listing of the claims, but not fully noted in the remarks.) Only claims 1-4 and 24-26 are currently pending, where 26 is dependent on claim 24 but withdrawn.

Concerning the Claim Objections, in the previous amendment of claim 1, the "and" noted in the Office Action's remarks was inadvertently not struck out. This has now been rectified.

The Office Action rejected claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over Fossum et al. (Pat. No. 5,841,126) in view of Nitta et al. (Pat. No. 7,081,921), with claim 4 further in view of Koyama et al. (Pat. No. 5,786,713), and rejected claims 24 and 25 under 35 U.S.C. § 103(a) being unpatentable over Tsang et al. (Pat. No. 5,900,623) in view of Applicant Admitted Prior Art. For the reasons given below, it is respectfully submitted that these rejections are not well founded and should be withdrawn.

Claims 1-4

Claims 1-3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fossum et al. (Pat. No. 5,841,126) in view of Nitta et al. (Pat. No. 7,081,921), with claim 4 rejected further in view of Koyama et al. (Pat. No. 5,786,713). It is respectfully submitted that these claims present an aspect of the present invention that is not found in these references, whether taken alone or in conjunction.

Claim 1 states:

> A method for image sensing comprising the acts of:
> producing, from a photo detector, a plurality of detected electronic signals responsive to an optical image;
> amplifying, with a column buffer amplifier, signals selected from the detected electronic signals to produce a plurality of amplified signals;
> sampling, with a correlated double sampler, signals selected from the amplified signals to produce a plurality of sampled signals;
> and
> clamping, by a clamp circuit, at least one signal selected from the sampled signals in response to a detecting of at least one over-saturation condition;
> whereby image inversion is at least partially abated.

The Office Action notes that "Fossum does not expressly teach clamping, by a clamp circuit, at least one signal selected from the sampled signals in response to a detecting of at least one over-saturation condition; whereby image inversion is at least partially abated", and then cites the Nitta reference for this purpose. However, it is respectfully submitted that this last element of claim 1 is also neither taught nor suggested by Nitta. More specifically, although Nitta does disclose a "clamp circuit" of sorts, this is for quite a different purpose and is explicitly ***not*** for "clamping [a] sampled signals in response to a detecting of at least one over-saturation condition; whereby image inversion is at least partially abated."

What Nitta presents in the cited location (column 5, lines3-29) is an optical black (OB) clamp, labeled as element 7 or 7B, depending on the figure. As described in Nitta with respect to Figures 2A, 2B, and 3, this OB black clamp is to provide an accurate reference level which is then subtracted from the luminance signal of a pixel. Consequently, this clamp circuit is to set the black level, a sort of intensity baseline. Nitta describes this succinctly at column 2, lines 52-55: "generating a reference black level value for the image sensor, and subtracting the reference black level value from the digitized output to generate the subtraction result as the digital luminance signal." Thus, the use of this black clamp is *always* as a matter of course, done to a given pixel signal to set its amplitude according to the base line–it is not in response to anything different occurring, and, in particular, it is not "in response to a detecting of at least one over-saturation condition", as stated in claim 1. Further, it is not performed for any abatement of image inversion, but just to set the reference black level.

In its remarks, on the subject of motivation for combing Nitta with Fossum, the Office Action states that "it would have been obvious ...to modify the method of Fossum detecting of at least one oversaturation condition; whereby image inversion is at least partially abated in order to provide low power consumption (Nitta, col. 2, lines 10-12)." However, the claim just ends with "whereby image inversion is at least partially abated", period; the "in order to provide low power consumption" is not found in the claims and was added by the Office Action. There is no explanation as to what is relation of abating image inversion is to what Nitta says at column 2, lines 10-12, namely "a front end signal processing method and apparatus which require low power consumption". The issue here is to abate image inversion; providing low power consumption is a separate issue. Further, contrary to its remarks on the motivation to "modify

the method of Fossum", in the previous paragraph, the Office Action has acknowledged that Fossum does not disclose "detecting of at least one oversaturation condition"

Consequently, as indicated particularly with respect to the elements with the added emphases, the last elements of claim 1 contain a number of elements not found in, and not suggested by, either Fossum or Nitta, whether taken alone or in conjunction:

> clamping, by a clamp circuit, at least *one signal selected from the sampled signals* *in response to a detecting of at least one over-saturation condition*;
> *whereby image inversion is at least partially abated.*

The Office Action acknowledges these elements are not found in Fossum. Although Nitta has an optical black clamp, it is just part of the standard operation of the circuitry given there and is performed at every cycle as a matter of course; this operation is not in response to detecting anything and, specifically is *not* "*in response to a detecting of at least one over-saturation condition*" and is not on a "selected signal". Further, Nitta neither teaches nor suggests that this process has anything to do with an operation "*whereby image inversion is at least partially abated*" and is silent on the subject of image inversion.

Consequently, for at least these reasons, it is respectfully submitted that a rejection of claim 1 along with dependent claims 2-4 based on Fossum in view of Nitta is not well founded and should be withdrawn.

Claims 24 and 25

Claims 24-25 are rejected under 35 U.S.C. § 103(a) being unpatentable over Tsang et al. (Pat. No. 5,900,623) in view of Applicant Admitted Prior Art. It is respectfully submitted that this rejection is in error and should be withdrawn. Additionally, it is believed that the Office Action is improperly interpreting the structure of the claim and incorrectly interpreting certain elements to be admitted prior art by misinterpreting the relationship between elements in the preamble and elements after the preamble. To avoid any such confusion, claim 24 has been amended to rearrange its elements somewhat.

The Office Action is correct in the Tsang also includes an image sensor that uses correlated double sampling; however, it is respectfully submitted that Tsang neither teaches nor suggests the aspects of the present invention to which claims 24 and 25 are drawn. In particular, the cited portions upon which the Office Action is relying for its rejection of the elements of

claim 24 are just a description of the reset process of Tsang, rather than for abating error in the luminance signal due to excessively rapid slewing.

More specifically, claim 24 (as amended and where the emphasis is added) is:

> In an image sensor that correlates a first sample of a first signal during a first interval after reset of a photo detector and a second sample of the first signal during a later interval in the same sampling cycle as the first interval to produce a luminance signal, a method comprising:
>
> *detecting* that the *first signal* is slewing excessively rapidly during the first interval; and
>
> in response to said detecting, limiting the value of the *first sample*;
>
> whereby the image sensor produces an output of improved accuracy by abating *an error in the luminance signal due to said excessively rapid slewing.*

For the production of a luminance signal, the Office Action cites Tsang at column 7, lines 28-67, which does describe such a process; however, it is for other elements of this claim, particularly where indicated by the added emphasis, that it is believed that the rejection is not well-founded.

The first element of claim 24 (again with added emphasis) is:

> *detecting* that the *first signal* is slewing excessively rapidly during the first interval;

for which the Office Action cites Tsang at column 10, lines 5-38. However, what this passage is describing is the reset process of in Tsang's device, where, *after* an integration period, the level at the node ST in Tsang's Figure 4 is reset to the level VRST *prior to starting* the next integration period. What is described, particularly at lines 5-17, is that device operation can be improved by resetting this value more rapidly and by resetting it to a higher level. (The use of a charge pump is suggested.) This is not the detecting of anything: it is merely a statement of how the reset mechanism works in Tsang. Further, what is being changed is not the "first signal during a first interval after reset"; rather, it is the level that is reset *during* the reset process (and is actually what the reset is resetting).

The second element of claim 24 is:

> in response to said detecting, limiting the value of the *first sample*;

where the emphasis is added again and for which the Office Action cites Tsang at column 10, lines 18-24. What Tsang describes in these lines is "clamping the reverse-biased voltage across the photodiode [PD, Tsang's Figure 4]"; however, this is again being done *during* the reset process to avoid charge overflowing when the node ST in Tsang's Figure 4 is reset to the level VRST. This not "limiting the value of the *first sample*" where, as defined in the preamble of the

claim, the "first sample" is "of a first signal during a first interval ***after*** reset", where the emphasis is again added.

Further, as noted at Tsang's column 10, lines 18-21, "blooming refers to bright spots on the display caused by large currents generated when the photodiode PD is momentarily forward biased" and is a problem that occurs *during* reset when charges overflows into adjoining pixels making them appear *brighter* than this should be. Thus, the described anti-blooming is for an error that may occur during reset, and is not "for abating an error in the luminance signal due to excessively rapid slewing *of the first signal during the first interval*" as the "first interval" of the claim is defined to be "*after* reset of a photo detector", where the emphasis is added.

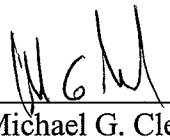
Concerning claim 25, this adds the limitation of "wherein: the error is an image inversion due to over-saturation." As noted in the quoted passage in the last paragraph, blooming leads to *bright spots* due undesired charge overflow. This is in contrast to an error due to "an image inversion due to over-saturation", which leads to the sort of spurious *dark* central area that may appear in the middle of a bright region, as described at lines 1-5 of page 2 of the present application. Although both relate to problems resulting from saturation, blooming causes adjacent pixels to be represented as too bright, as opposed to an image inversion where a saturated, or near saturated, pixel is represented as too dark.

Consequently, for at least these reasons, it is respectfully submitted that a rejection of claim 24 along with dependent claim 25 under 35 U.S.C. § 103(a) being unpatentable over Tsang et al. (Pat. No. 5,900,623) in view of Applicant Admitted Prior Art is not well founded and should be withdrawn.

Conclusion

Accordingly, it is believed that this application is now in condition for allowance and an early indication of its allowance is solicited. However, if the Examiner has any further matters that need to be resolved, a telephone call to the undersigned at 415-318-1160 would be appreciated.

Respectfully submitted,



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